CLAIMS

1. A method for up-interpolating a Bayer mosaic image from input space to output space, said Bayer mosaic image comprising a plurality of four-pixel blocks, each pixel in said blocks being one of three different colors with one of two of said pixels being a dominant color and two of said pixels being non-dominant colors, said method including the steps of:

reading a two dimensional color plane of said Bayer image for each said color;

mapping said pixels of said dominant color from said input space to said output space by:

multiplying each ordinate of said input space by $1/\sqrt{2}$; and

scaling coordinates of said input space to a normalized coefficient kernel by multiplying said ordinates by $1/\sqrt{2}$;

mapping said pixels of said non-dominant colors by multiplying each ordinate of said input space by 1/2;

for each color, convolving said input space pixels with a coefficient kernel for each color; and

writing said mapped pixels to a storage location.

2. The method of claim 1 wherein said three different colors are red, green and blue.

3. The method of claim 1 or 2 wherein said dominant color is green.

4. The method of claim 1 wherein said coefficient kernel is the same for said two non-dominant colors but different for said dominant color.

5. The method of claim 1 wherein, for said dominant color, said mapping step further includes sampling a 4x4 pixel block.

6. An apparatus for up-interpolating a Bayer mosaic image from input space to output space, said Bayer mosaic image comprising a plurality of four-pixel blocks, each pixel in said blocks being one of three different colors with one of two of said pixels being a dominant color and two of said pixels being non-dominant colors, said apparatus comprising:

an input buffer for each color for storing said input space pixel values;

a coefficient kernel for each color, said coefficient kernel for said dominant color being normalized;

a convolve unit for each color for convolving said input space pixel values with said kernel coefficients; and

an output buffer for storing mapped pixel values.

7. The apparatus of claim 6 further comprising processing means for sampling a 4x4 pixel block for said dominant color.

8. A method of interpolating a Bayer image of red, green and blue pixels from an input space to an output space, the method including the steps of:

receiving the Bayer image; and

mapping each of the colors to the output space in accordance with the following equations:

$$x'=(x/ops)+k_1$$

$$y'=(y/ops)+k_2$$

where x,y is a coordinate in the output space, x'y' is the coordinate in the input space, ops is the number of pixels in the output space per input space sample, and $k_{1,2}$ are either 0 or-0.5 depending on the color and the desired relative rotational orientation of the image.

9. The method of claim 8 wherein, for the green pixels in the input space, each ordinate of the input space is multiplied by $1/\sqrt{2}$.

10. The method of claim 8 wherein, for the green pixels in the input space, each coordinate of the input space is multiplied by $1/\sqrt{2}$.

11. A method of sampling a Bayer image having two dimensional planes of red, green and blue pixels, the method including the steps of:

rotating the green plane by 45°;

sequentially sampling an m x m pixel block of the rotated plane, where m is an integer greater than 1;

providing an address for the m^2 samples by determining a starting address for a first of the samples and thereafter applying a predetermined fixed sequence of offsets to obtain the addresses of the remaining samples.

12. The method of claim 11 wherein the step of determining the starting address is responsive to the relative rotational orientation of the image.

13. The method of claim 11 wherein m=4 and there are sixteen offsets.

14. An apparatus for sampling a Bayer image having two dimensional planes of red, green and blue pixels, the apparatus comprising:

input means for rotating the green plane by 45°;

processing means for sequentially sampling an m x m pixel block of the rotated plane, where m is an integer greater than 1;

address means for providing an address for the m^2 samples by determining a starting address for a first of the samples and thereafter applying a predetermined fixed sequence of offsets to obtain the addresses of the remaining samples.